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ABSTRACT

This study examined the correlates of high school students' preferences in their senior year to attend private or public higher education institutions, and especially the effects of student sensitivity to tuition costs and to financial aid. The data analyzed were from a longitudinal study (n=482) of student college choice. The dependent variable was student preference to attend public or private institutions; the independent variables were student background characteristics, student academic characteristics, and student sensitivity to tuition and financial aid. Results indicated that student preferences to go to private institutions were influenced jointly by family, academic, and financial factors. Mother's education, particularly postgraduate education, was significantly and positively related to student preference for a private institution. Other family background characteristics, including family income, were not related to student preference for type of postsecondary institution, but students with better academic preparation were more likely to prefer private institutions. Student sensitivity to tuition and financial aid were related differently to choice of private institutions students interested in private institutions were less concerned about tuition costs but more interested in financial aid. (Contains 37 references.) (DB)

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The Linkage of Student Price Sensitivity with Preferences to Postsecondary Institutions

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held in Miami, Florida, November 5-8, 1998. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Abstract

This study focuses on the correlates of student preferences to attend private/public institutions in their senior year in high school, with a particular focus on the effects of student sensitivity to tuition costs and to financial aid. The data analyzed in this study were drawn from a longitudinal study on the postsecondary educational choices of high school students in the state of Indiana. The results from logistic regression indicate that in addition to student and family background and student academic characteristics, student sensitivity to tuition costs and to financial aid exerts significant effects on student preferences to attend public or private institutions. Those students who are more sensitive to tuition costs are more likely to be interested in public institutions, and those who are more sensitive to financial aid are more likely to prefer private institutions. This study suggests that family and ascribed characteristics alone do not explain student preferences to postsecondary institutional type. Student subjective sensitivity to tuition costs and to financial aid is also directly related to student preferences in choosing institutions, independent of student family background and academic characteristics. This suggests that the willingness to pay, not only the ability to pay, plays a direct role in student college choice decisions. The implications for policy making are discussed.

The Linkage of Student Price Sensitivity

with Preferences to Postsecondary Institutions

Introduction

The concerns about whether students go to college (access) and where students go to college (choice) have been on the policy agendas at federal and state governments for decades (McPherson and Schapiro, 1991). Researchers have demonstrated that attending private and public postsecondary institutions could lead to different educational attainments and career outcomes (James, Alsalam, Conaty, and To, 1989; Pascarella and Terenzini, 1991). Public policy makers are concerned about the access to and choice of private postsecondary institutions by students from different background with respect to gender, race or ethnicity, and socioeconomic status because of a social equity concern (McPherson and Schapiro, 1991). Meanwhile, private institutions are believed to be at a competitive disadvantage due to the "tuition gap," the difference between the stated tuition of public and private institutions (Tierney, 1980a), particularly as the gap of stated tuition in these two sectors is growing. For campus policy makers at both public and private institutions, as the market for college student enrollments become more competitive, the use of tuition and financial aid as policy levers to maintain enrollment and institutional financial health has become common practice (McPherson and Schapiro, 1998). Thus, to identify the factors related to student preferences to postsecondary institutions in public or private sectors is not only an interesting research question but has significant implications for both governmental and institutional policy makers.

Research on the impact of tuition costs and student financial aid on student college choice behaviors is prevalent in higher education literature (McPherson, Shapiro and Winston, 1993; Mumper, 1996; Weiler, 1996). However, the past studies were constrained in several ways. First, researchers paid much attention to student

matriculation and enrollment behavioral variables but rarely on student subjective preferences and expectations (Manski, 1993). The concept of "willingness to pay" is of conceptual significance but lacked empirical support. The limitation of the failure to include student attitudinal variables on student college choice research in previous studies was noted by economists (Manski, 1993). Second, many studies on student price responsiveness to college tuition costs and to financial aid focused on student matriculation behaviors but neglected the effect of student price sensitivity on student application intentions (Savoca, 1993). In her study, Savoca (1993) found out that student price sensitivity can influence student college application decisions, and further, their college matriculation outcomes. Third, not until recently did the researchers discover that tuition pricing and financial aid offer exert different impacts on student educational participation decisions (St. John and Starkey, 1995). Researchers have also found some evidence that students enrolled in private and public institutions were concerned about tuition and financial aid differently (Paulsen and St. John, 1997; St. John, Paulsen and Starkey, 1996), but the empirical studies with a focus on student price sensitivity and college choice are scarce.

This study attempts to undertake an empirical study that would link high school students' subjective response to tuition costs and to financial aid and their preferences to attend private/public institutions. The purpose of this study is to explore the correlates of student preferences to private institutions at their senior year in high school. Specifically, this study is intended to examine whether student subjective sensitivity to college tuition and to financial aid has some linkage with their preferences of postsecondary institutional type.

Theoretical Perspectives

Studies on student college choice were rife in the literature varying from sociology, economics, and education. In the research from a sociological perspective,

the role of background characteristics such as gender, race and ethnicity, parental income, parental education, and student grade-point-average are commonly used in studies of status attainment (Coleman, Hoffer and Kilgor, 1982; Hanson, 1994; Karen, 1991; Sewell, Haller, and Ohlendorf, 1970). With respect to student decisions to attend high-cost institutions, Hearn (1988) found that student academic preparation and aspiration are among the most significant predictors of student attendance at high-cost institutions. Hearn and other researchers demonstrated that background factors such as gender, parental education, parental income and student race or ethnicity can exert strong indirect as well as direct influence on student academic achievement and educational plans (Hearn, 1988, 1991; Hossler and Stage, 1992).

Economists base their models of postsecondary participation and college choice upon human capital theory. Individuals are assumed to make postsecondary educational decisions basing on variables such as the expected costs, the expected benefits, and the utility of educational options. Therefore, financial attributes of educational institutions (e.g., tuition, financial aid, housing, and cost of commuting) are frequently included. Several studies of postsecondary participation and college choice have been conducted employing some or all of these variables to study outcomes of student college choice (Bishop, 1977; Kohn, Manksi, and Mundel, 1976; Manski and Wise, 1983; McPherson and Shapiro, 1991; Parker and Summers, 1993). Previous studies suggest that increases on tuition costs will reduce the demands for postsecondary education and the offers of financial aid will offset this decrease (Heller, 1997; Leslie and Brinkman, 1988). However, economists were constantly surprised at the fact that demands for postsecondary education in America are keeping stable although the net price (tuition costs minus financial aid) for college attendance has been increasing.

A derivative from economic and sociological perspectives is marketing research on consumers' price sensitivity (Krishnamurthi and Raj, 1991). From the perspective

in this direction, consumers with different preferences were believed to have different price sensitivity in their purchase behavior. As marketing perspectives gain popularity in enrollment management, higher education researchers realize that market segmentation, whereby students from different background have different preferences, is part of the complexity in American postsecondary educational market (Landscape, 1997).

Researchers on student college choice in the field of higher education synthesized the results from college choice researches and proposed several student college choice models workable for educational policy makers (for example, Hossler, Braxton and Coopersmith, 1989). Particularly, educational researchers emphasize that it is important to focus not only on student choice outcome but also on student college choice process. Hossler and Gallagher (1987), for example, proposed a three-stage (predisposition, search, and choice) college choice model and argued that different factors were related to student decisions in each stage respectively.

This study focuses on the correlates of student preferences to attend private institutions in their college choice process. The research questions of interest in the present study are as follows: 1) What factors are associated with student preferences to private colleges over public institutions? 2) Are there any differences in the influences of sensitivity to tuition and to financial aid on student preferences to attend private college?

Research Design

The sample for this study was drawn from all students attending twenty-one high schools within the state of Indiana. A cluster design was used to select schools to assure that the sample represented adequate numbers of ethnic minorities, students at all levels of socioeconomic status, and rural as well as metropolitan high schools (Borg and Gall, 1989). The total sample of students and parents was surveyed ten

times between their freshman (1986-1987) and senior years (1989-1990) in high school. The total sample is part of a longitudinal study of student college choice funded by the Lilly Endowment.

In this study, we draw sample from responses to questionnaires distributed at the time students were at the 12th grade to students who previously indicated that they had plans to go to college. From a total sample of 939, we drew a sample of 482 students without missing variables of interest for this study. The dependent variable is student preferences to attend private institutions. We constructed this variable by comparing student reported importance to go to the private colleges with the reported importance to attend the public institutions, and students who were indifferent to private and public institutions were treated as subjects of no preferences to private institutions. The selection of independent variables is based on the perspectives in research on student college choice. The independent variables were student background characteristics (gender, race and ethnicity, father's education, mother's education, and parental income), student academic characteristics (student high school GPA and student educational expectation), and student sensitivity to tuition and to financial aid. The definitions and coding strategy for the dependent and independent variables were presented in Table 1. In order to examine the so-called "middle income melt" problem (McPherson and Schapiro, 1991), we compared students from family income between $35,000 and $50,000 with the other two groups whose family income was below $35,000 or above $50,000. With respect to parental education, we intend to examine the role of parental college education (some college or college) on children's institutional preferences, compared with parental education was lower than college education and higher than college education. We also intend to examine the role of student educational expectation on their institutional preferences and try to explore whether those who expected postgraduate education would be more likely to prefer private institutions.

(Insert Table 1 About Here)

Logistic regression was appropriate for data analysis in this study since the outcome variable is dichotomous (Cabrera, 1994). The analytical method employed in this study is similar to those used by other researchers in college choice and financial aid research (St. John, Paulsen, and Starkey, 1996). The sequential logistic regression approach was used to "step in" sets of variables in order to examine both the direct effects of the entered variables and the interaction effects of these variables with the successive variables. In order to examine whether interaction effects between student sensitivity to tuition and to financial aid is significant, we first integrated the interaction factor in logistic regression analysis but we found that the interaction factor was not significant at 0.1 level. In our final model, we decided not to use the interaction factor of student sensitivity to tuition costs and to financial aid.

Delta-p statistics were developed for each variable in each step of logistic regression using a method recommended by Peterson (1984) as used by St. John and Starkey (1995). The delta-p statistic provides a measure of the change in the probability of the outcome that can be interpreted as attributed to a unit change in a given variable in the model. Particularly, for categorical variables, a significant delta-p statistics can be interpreted as the probability of change of the outcome for those with the specific characteristics as opposed to those with the comparison characteristics. However, researchers recommended that only the delta-p values for the variables with statistic significance be interpreted (Cabrera, 1994). We also provided the log likelihood statistic (-2 Log L) for each model. The log likelihood statistics provides an indication of fit of the model and smaller number represents a better fit of the model (St. John and Starkey, 1995).

Results

The descriptive statistics about the variables and the samples for this study are presented in Table 2. The descriptive statistics points to several interesting facts about this sample: 1) a small proportion of students (15%) tend to prefer private institutions; 2) the majority grades in high school is B- or above; 3) for students who planned to go to college, nearly half of them had some expectations to continue post-graduate education or professional education; 4) about 80% student sample reported the importance of financial aid in their college decisions.

(Insert Table 2 About Here)

Table 3 presents the coefficient estimates and the delta-p statistics from the sequential logistic regression. At the first step, student background variables were included in the logistic regression model. The results indicate that mother's educational level is the only significant variable concerning student background characteristics in predicting student preferences to private institutions. Compared with students whose mother's educational level is at college level or with some college education, students whose mother's educational level is post-graduate education were 13 percentage points more likely to prefer private institutions, and students whose mother's education is at grade school or below were 8.2 percentage points less likely to prefer private institutions. In this step, no significant differences were found between student institutional preferences with respect to student gender, race or ethnicity, father's educational level, and parental income.

In the second step, we included student high school GPA in the regression. The results show that high school GPA is positively significant in predicting the probability of student to go to private institutions. Compared with students whose high school GPA is not higher than C+, students whose high school GPA is between B- to B+ are 15.8 percentage points more likely to prefer to private institution, and

student whose high school GPA is between A- to A+ are 24.1 percentage points more likely to prefer to private institutions.

In the third step, student educational expectation variables were included. It is still true that students whose GPA is higher than B+ are more likely to prefer private institution, compared with those whose GPA is not higher than C+, but the difference between students with GPA at C+ or below and between B- and B+ disappeared. The significance of student educational expectation, not surprisingly, indicate that students who expected to go to two year colleges were less interested in private institutions, compared with those who expected to go to four year colleges. Those who expected to have post-graduate education were not significantly different from those hoped to go to four year colleges, suggesting high school students did not treat private institutional attendance as a vehicle to post-graduate education. The diminished significance of the differences between students whose high school GPA was between B- and B+ and whose GPA was C+ or below suggests the effects of high school GPA were mediated by student educational expectation.

Finally, variables concerning student sensitivity to tuition costs and financial aid were included. Student reported importance of low tuition is negatively related to the probability to go to private institution, suggesting that students who were more sensitive to tuition costs were less likely to prefer to private institutions. Students who were sensitive to tuition costs are 8 percentage points less likely to prefer to private institutions, compared to those who were not sensitive to tuition costs. Student reported importance of financial aid is positively related to the probability to attend private colleges, suggesting that students who were more sensitive to financial aid were more likely to prefer to private institutions. Students who were sensitive to financial aid are 11.2 percentage points more likely to prefer to private institutions, compared to those who were not sensitive to financial aid. In this step, the variable concerning student minority status was positively related to preferences to private

institutions. This suggests after controlling the effects of student sensitivity to tuition and financial aid, students of color are more likely to prefer to private institutions.

(Insert Table 3 About Here)

The additions of variables in each sequential step increased the predictive strength of the model significantly. With each step, as the -2 log L decreased, the goodness of fit and the percentage of correctly predicted cases increased, all of which is consistent with the increasing predictive power of the models (Cabrera, 1994; St. John and Starkey, 1995).

Conclusions and Implications

This study demonstrates that student preferences to go to private institutions are influenced jointly by family, academic, and finance related factors. The results point to several conclusions. First, mother's education, particularly post-graduate education, will have significant positive impacts on student preferences to private institutions. Other family background characteristics, including family income, have no significant effects on student preferences of postsecondary institutional type. But when student price sensitivity variables were controlled, students of color were more likely to prefer private institutions. Second, students who had better academic preparations in high school are more likely to prefer private institutions after high school study. However, student educational expectations were found to have more bearing on student institutional preferences. The positive effects of academic preparation on private institutional preferences were mediated by education expectations to some extent. Third, student sensitivity to tuition and to financial aid are related to student choice of private institutions differently. On the one hand, high school students who prefer private institutions are less concerned about tuition costs compared to those interested

in public institutions, holding other factors constant. On the other hand, students with interests to go to private colleges think financial aid is more important in their college decisions compared to those who intended to go to public institutions, other things equal.

The results that student sensitivity to tuition costs and to financial aid is linked with their institutional preferences differently are informative. Federal and state governments and postsecondary educational institutions should take these differences into policy consideration about college tuition and financial aid. "High tuition high aid" policy (Hearn and Longanecker, 1985) was a fashionable policy alternative in the postsecondary educational policy arena since the late 1980s. However, from the results of this study, we found that student price sensitivity is closely linked with their choice preferences to institutional type. It suggests that the policy based upon the "high tuition high aid" logic may result in intended consequences for private colleges but lead to unexpected problems for public institutions. The results suggest "the tuition recycling practice" based on "high tuition high aid" logic need to be reexamined with respect to institutional context. The successes of tuition recycling policy in private institutions are consistent with the findings from this study and this practice was documented in recent literature (Basch, 1997). However, if public institutions tend to adopt the similar "recycling" strategy, it is possible that student profiles could change in some unpredictable way. Institutional and public policy makers should realize that not only "the ability to pay" but "the willingness to pay" are also at work in student choice decisions. This type of market segmentation in postsecondary education is exactly like the consumers' purchase behaviors in the commodity market (Krishnamurthi and Raj, 1991): for those who are interested in private institutions, they are less sensitive to tuition costs. However, they are more sensitive to financial aid, suggesting financial aid is increasingly becoming a necessity for students who want a private education. In this sense, consistent with the previous

study (Tierney, 1980b), student financial aid would be an efficacious mechanism to redistribute students between public and private institutions.

In addition, we found that mother's educational level is the only significant family background factor in differentiating student institutional preferences. This may indicate that student pre-college choice preferences do not differ dramatically with respect to family background characteristics. In fact, when other things are equal, students of color tend to be more likely to prefer private institutions. However, researchers have found that students from low income or middle income families and students of color have been fleeing away from private institutions since late 1980s (McPherson and Schapiro, 1991). This contradiction may suggest that financial aid may not be sufficient enough to help students from low income and middle income students and students of color to turn their institutional preferences into actual matriculations.

For educational researchers, this study suggests further research efforts on the determinants of student price sensitivity to tuition costs and to financial aid are warranted. In a previous study, we found that student family income can reduce student sensitivity to tuition costs and financial aid significantly (Hossler, Hu, and Schimt, 1998). This may, to some extent, explain the findings that student income has no bearings on student preferences to private institutions, if student sensitivity to tuition costs and to financial aid is linked with institutional preferences in opposite ways. To further explore in this direction will enrich the understanding of the complex interdependence of student socioeconomic status, price sensitivity to tuition costs and to financial aid, and student institutional preferences.

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Table 1 Variable definitions and coding

1. Dependent variable:

Student preference to attend private institutions:

Students whose reported importance of attending a private institution is higher than the reported importance of attending a public institution were coded as 1, otherwise 0.

2. Independent variables:

Gender: 1=female, 0=male.

Race or ethnicity: 1=student of color, 0=white.

Father's/Mother's education (some college or college as reference group):

High school or below: 1=yes; 0=no.
Post-college or beyond: 1=yes; 0=no.

Parent income (Parental income from $35,000 to $50,000 as reference group):

Parental income $35,000 or less: 1=yes; 0=no.
Parental income $50,000 or beyond: 1=yes; 0=no.

Grade point average in high school (GPA) (lower than C+ as reference group):

GPA is between B- to B+: 1=yes; 0=no.
GPA is between A- to A+: 1=yes; 0=no.

Student education expectation (four-year college as reference group):

Vocational-technical and two-year college: 1=yes; 0=no.
Master's degree or professional degree: 1=yes; 0=no.

Sensitive to tuition costs:

Students whose reported importance of attending a low tuition institution is "very important" or "important" were coded as 1, and "undecided" "somewhat important," and "not important" were coded as 0.

Sensitive to financial aid:

Students whose reported importance of attending a institution of awarding financial aid is "very important" or "important" were coded as 1, and "undecided" "somewhat important," and "not important" were coded as 0.

Table 2 Sample characteristics for this study

Variable		Cases	Percentage(%)
Student preference to attend private institutions			
	Yes	73	15.15
	No	409	84.85
Gender			
	Female	239	49.59
	Male	243	50.41
Race or ethnicity			
	Student of color	34	7.05
	White	448	92.95
Father's Education:			
	High school or below	186	38.59
	Some college or college	208	43.15
	Post-college or beyond	88	18.26
Mother's Education			
	High school or below	214	44.40
	Some college or college	216	44.81
	Post-college or beyond	52	10.79
Parent income			
	$35,000 or less:	240	49.79
	Between $35,000 and $50,000	155	32.16
	$50,000 or more:	87	18.05
GPA in high school			
	C+ or lower	77	15.98
	Between B- and B+:	263	54.56
	Between A- and A+:	142	29.46
Student education expectation			
	Vocational-technical and two-year college	61	12.66
	Four year college	190	39.41
	Master's degree or professional degree	231	47.93
Sensitive to tuition costs			
	Yes	267	55.39
	No	215	44.61
Sensitive to financial aid			
	Yes	383	79.46
	No	99	20.54

Note: Sample size=428.

Table 3 Coefficient estimates and Delta-P from sequential logistic regression

Variables	B	Delta-P	B	Delta-P	B	Delta-P	B	Delta-P
Female	.015	.002	-.085	-.010	-.079	-.010	.0112	.001
Student of color	.511	.008	.606	.095	.738	.120	.893*	.152
Father's Education								
High school or below	.124	.017	.142	.019	.249	.035	.193	.027
Post-college or beyond	.140	.019	.063	.008	.037	.004	-.013	-.002
(Some college and college)								
Mother's Education								
High school or below	-.871***	-.082	-.880***	-.082	-.791**	-.077	-.799**	.077
Post-college or beyond	.784**	.130	.670*	.107	.686*	.110	.770**	.127
Some college and college)								
Parent income								
Income $35,000 or less	.400	.059	.415	.061	.403	.059	.413	.061
Income $50,000 or beyond	.447	.067	.424	.063	.408	.060	.549	.085
(Between $35,000 to $50,000)								
GPA in high school								
GPA is between B- to B+			.919*	.158	.728	.118	.797	.132
GPA is between A- to A+			1.287**	.241	.982*	.171	.899	.153
(GPA is C+ or below)								
Student education expectation								
Vocational-technical and two-year college					-2.039*	-.129	-2.058*	-.129
Master's degree/professional degree					.090	.012	-.019	-.002
(Four year college)								
Sensitive to tuition costs							-.848***	-.080
Sensitive to financial aid							.695*	.112
-2 Log.	386.79		379.48		372.01		362.46	
PCP	84.85%		85.06%		85.06%		85.89%	

Note: Sample size=482; Significance level: *p<.1, **p<.05, ***p<.01.